SCIENTIFIC MUSEUM.

Manufacture of Blue.

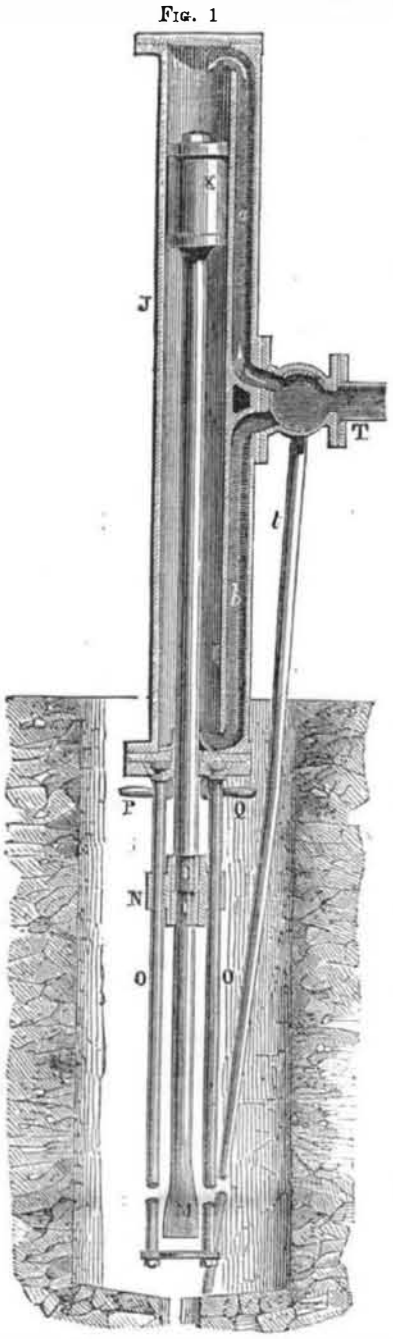
A blue coloring matter is made in Holland from the "Turnesol," and imported into other countries in cakes. A considerable quantity is used in France, particularly in the northern departments, where the Holland blue has a high reputation. An attempt has been lately made in that country to manufacture it at home. The tinctorial lichens that form the base of this blue, and which serve for preparing it, are the "Rocella Tinctoria," of the Canary Isles, the "Fuciformis" of Cape Verd, the "Tartarens" of Sweden and Norway, the "Lecanora Barella" of Auvergne (France), the "Imbilicaria Pustulata," common in the last-named country, and the "Rocella Fucopsis, very common on the elevated rocks of the Mediterranean Sea and Atlantic Ocean, and which is also very plentiful on the coast of Normandy, and of the Bay of Biscay, &c. There are many other lichens more or less esteemed as tinctorial, in Provence, Languedoc, Roussillon, (France), which are previously examined to determine the quality of their coloring matter, for this purpose the specimen is first pulverized and the powder placed in a vessel with a little sal ammoniac moistened with a mixture, in equal proportions, of liquid ammonia and lime, the vessel should be only half filled, so that when the mouth is stoppered it may contain some air. At the expiration of three or four days the lichen that is being tested ought to have turned to a red color. In this manner it is easy to determine the value of the various lichens offered for sale according to the degree of intensity of their red coloring. Having selected a preferable lichen it is pounded in a mortar, during which process sufficient water is added to form it into a thick paste, this is done to assist in pounding it. Equal quantities of lichen in this state and potash are then taken and mixed up together effectually, after which the compound is exposed to fermentation. This is caused by placing it in stone troughs in a building which is heated to a suitable temperature to keep up a continued fermentation until the reaction of the alkali on the coloring matter has taken place. When the paste has been placed in the troughs it is moistened with stale urine or urine containing carbonate of ammonia. This urine, therefore, developes much ammonia, which acts on the coloring matter; the compound is shaken several times, and after each time the troughs are covered to allow the gas from the ammonia to re-act on the dying substance, more urine being added whenever no further gas is emitted from the substance. The potash is intended to increase the action of the ammoniated urine on the coloring matter and to give it more strength. At the end of eight or ten days the mixture becomes a dull red, after twenty-five or thirty days it is a very fine purple red, and ten or twelve days after it changes completely to a blue. In this state ammoniated urine must be added, and the whole to be shaken as often as it seems expedient for about forty days. When the paste has become blue there is added one-fortieth part of lime to neutralize the ammonia, by causing a disengagement of this latter. Dissolved glue, in a suitable quantity, is then poured in to solidify it, and to bind together the substances that form the paste. It is of importance that its consistency should be such, that when steeped in warm water it should give to the water its blue color without dissolving, if it is too liquid it is left to evaporate. When it is of a proper consistency it is pounded in a machine to render it finer, and easier to be moulded, and after this placed in moulds and dried in the open air or near a stove. This coloring substance is a sort of lac, the base of which is the ligneous part of the lichen and the alkaline salts, and on which is fixed the coloring matter of the tinctorial lichens changed to blue by the action of the alkalies. It is used chiefly in France for whitewashing houses, by laundresses for getting up linen, by sugar refiners, &c. &c.; it is also useful as a substance called Turnesol dye, which is the most powerful agent in determining the presence of free acids, these acids flying to the alkali and changing the dye to a red, which is its essential color. —[Genie Industriel.

Wells, Pumps, &c.

[Continued from page 168.]

STEAM BORING MACHINE FOR QUARRIES, &c.—The annexed engravings are views of

FIG. 1



steam machinery for boring by M. Cave, of Paris, a celebrated French engineer, and which has been illustrated in the "London Artisan."

For the great majority of mining, quarrying, and tunnelling operations, boring and blasting is employed, and it is for this object that M. Cave's machinery is designed.

FIG. 2.

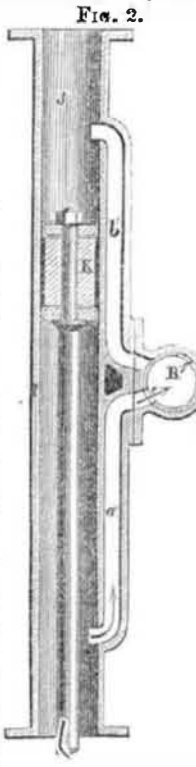


FIG. 3.

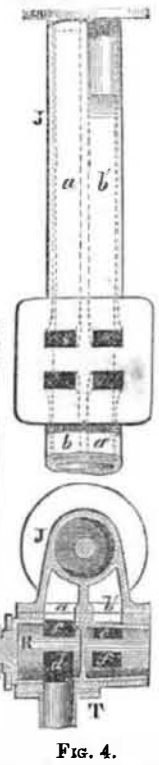
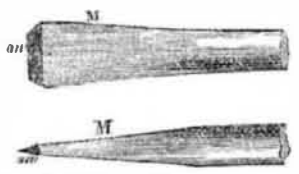


FIG. 4.

It consists of a cylinder and piston actuated by steam, compressed air, or by the vacuum system, the cutting tools being attached to the piston-rod, and acting by percussion. It thus resembles a Nasmyth's steam hammer; and a similar means is employed to destroy the momentum of the piston, by enclosing a portion of steam or air, which acts as a cushion at each end of the cylinder. To carry out this purpose, the inlet and exhaust passages are kept quite distinct, as will be seen on referring to the drawings.

Figure 1 is an elevation of the machine in section through the inlet passages; figure 2 is an elevation of the cylinder in section through the outlet passages; figure 3 is a front elevation, showing the passages; and figure 4 is a plan in section through the passages. J is the cylinder, containing the piston, K, to the rod of which is attached a cross-head, N, to which is also fixed the chisel, M. The cross-head and chisel are guided by the guide-rods, O O, which are fixed in a plate dovetailed into the cylinder cover, in such a manner, that it can be freely turned round (with the piston) by means of the handles, P Q, and thus enable the chisel to take a fresh cut at every stroke, without which it would jam. The annexed sketches show the shape of the chisel and its cutting edge.

The admission and emission of the compressed air or steam is regulated by a four-way cock, R, supplied by a pipe, T, as shown in figure 1. The air is admitted through the inlet passage, *a*, on the top of the piston, which will rapidly descend, until it passes the outlet, *a'*, figure 2, when, the further escape of air being prevented, the piston is stopped



by the air-cushion. On the up-stroke, the cock having been turned, the compressed air enters by the passage, *b*, and escapes by the passage, *b'*. It will be observed that the plug of the cock is divided transversely by a diaphragm, shown in fig. 4, to keep the passages distinct, *c* and *d* answering to the two inlet passages, and *e* and *f* to the two outlets.

The air which escapes by the cylinder is led, by the pipe, *t*, to near the point of the chisel, and will have the effect of blowing away the small chips loosened by the chisel.

The machine is shown in the engraving as working vertically; but it could obviously be applied to driving a level, by placing it horizontally and mounting it on a carriage.

If it be desired to bore a hole of larger diameter than the width of a chisel, the cutter can be fixed at any desired distance from the centre of the piston-rod, the revolution of which will cause the cutter to describe a circle of corresponding diameter.

For sinking shafts, a number of cylinders might be employed simultaneously, working a sufficient number of chisels to extend round the shaft; and the same arrangement applied horizontally would serve to drive a level.—In vertical boring the chisels have to be regularly withdrawn, in order to permit of the extraction of the *debris*; but we do not find that the author has provided any special means for effecting this object.

He has suggested that the electro-magnetic power may be applied to work this machinery; but air appears to offer the most tangible advantages. It can be conducted a great distance without suffering condensation, as steam does; and it would materially improve the atmosphere of the mine, by blowing in fresh air, or, if worked on the vacuum system, it would be equally advantageous in coal mines, by serving to draw off the fire-damp.

Man's Food.

What do men really live upon? The answer will be various enough. The Guacho, who in the wild pampas of Buenos Ayres, managing his half-wild horse with incredible dexterity, throws the lasso, or lolas, to catch the ostrich, the guanaco, or the wild bull, consumes daily from ten to twelve pounds of meat, and regards it as a high feast-day when in any hacienda he gains a variety in the shape of a morsel of pumpkin. The word bread does not exist in his vocabulary. The Irishman, on the other hand, regales himself in careless mirth on "potatoes and point," after a day of painful labor, he who cannot help making a joke even of the name he gives to his scanty meal. The hunter of the prairies lays low the buffalo with sure bullet; and its juicy, fat streaked hump, roasted between two hot stones, is to him the greatest of delicacies. Meanwhile, the industrious Chinese carries to market his carefully fattened rats delicately arranged upon white sticks, certain to find a good customer among the epicures of Pekin; and in his hot, smoky hut, fast buried beneath the snow and ice, the Greenlander consumes his fat, which he has just carved, rejoicing over the costly prize, from a stranded whale. Here the black slave eats the sugar-cane, and eats his banana; there the African merchant fills his wallet with sweet dates, his sole subsistence in the long desert journey; and there the Siamese crams himself with a quantity of rice from which a European would shrink appalled. And wheresoever over the whole inhabited earth we approach and demand hospitality, in almost every little spot a different kind of food is set before us, and the "daily bread" offered in another form.

Cooked Food for Cows.

Mr. James S. Huber, lately stated before the Philadelphia County Farmer's Club, that he had proved by actual experiment in feeding 12 cows, 180 days upon cooked food, that he made a net gain of $32. In place of 20 lbs. of hay per day, formerly fed raw, he now feeds 12 lbs. cut and steamed. With this he mixes 4½ quarts of shipstuff, Indian corn meal and oil cake meal, in about equal portions. This with the hay, weighs about 46 lbs. when cooked, having gained about 31 lbs. by that process. He says it is not only more economical, but more palatable to the cattle; they eat it without waste and keep in better condition. His steaming apparatus cost $25, which he more than saved in six months' feeding. He considers, however, the greatest gain is in the health of the animals.—[N. Y. Agricultor.

West Castleton Slate.

One hundred and fifty tons of West Castleton slate have been carried to Boston within the past week, making 350 tons in two weeks, over the Rutland, Cheshire, and Fitchburg roads. A gang of 500 men are to be employed in getting out this slate the coming summer. Extensive machinery is also to be introduced, and with these increased facilities, the directors of the company are confident that they can supply the American market with American slate of a superior quality, and at a much cheaper rate than has heretofore been paid.